

CLAIMS

1. Self-igniting gasoline internal combustion engine comprising at least one cylinder (1),
a cylinder head (2) closing the cylinder (1), a piston (3) slidably arranged in the cylinder (1), a
5 combustion chamber (4) defined in the cylinder (1) between an upper face (30) of the piston (3)
and a lower face (20) of the cylinder head (2), means (5) for injecting gasoline into the
combustion chamber (4), intake valves (7) and exhaust valves (8) selectively closing the
combustion chamber (4), an injection pump (8) intended to supply the injection (5) with
pressurized gasoline, the ignition of the air-gasoline mixture being obtained spontaneously in at
10 least a range of operation of the engine thanks to thermodynamic conditions in the combustion
chamber (4), characterized in that the pressure of the gasoline provided to the injector (5) is
above 250 bars.

2. Engine according to claim 1, characterized in that the pressure of the gasoline provided
to the injector (5) reaches or is above 500 bars.

15 3. Engine according to claim 1 or 2, characterized in that injection of the gasoline is made
in a time interval situated at the end of the cycle of compression of the load by the cylinder (3).

4. Engine according to any of claims 1 to 3, characterized in that injection of the gasoline
is made in a time interval comprised between 60 degrees crankshaft before the high dead center
of the combustion cycle and 20 degrees crankshaft after the high dead center.

20 5. Engine according to any of claims 1 to 4, characterized in that it comprises means (11)
for supercharging the intake air intended to be supplied to the combustion chamber (4).

6. Engine according to any of claims 1 to 5, characterized in that, at least in a range of
operation of the engine, the amount of gasoline delivered by the pump (8) to the injection means

(5) for a combustion cycle is fractionated in the form of a plurality of partial and distinct injections.

7. Engine according to claim 6, characterized in that it comprises at least one partial injection delivered during the air intake phase into the combustion chamber (4) or during the first part of the compression, and at least one partial injection delivered around the high dead center, i.e., at a time interval comprised between 60 degrees crankshaft before the combustion high dead center and 20 degrees after this combustion high dead center.

8. Engine according to any of claims 1 to 7, characterized in that it comprises ignition means (6) intended to produce ignition of the air-gasoline mixture in the combustion chamber (4) during the so-called very low load or very high load ranges of operation.

9. Engine according to any of the preceding claims, characterized in that it uses a ratio of residual gases above 20%, and preferably above 50%.

10. Engine according to any of the preceding claims, characterized in that it uses a variable compression ratio.

11. Engine according to any of the preceding claims, characterized in that it is of the direct-jet or pseudo-direct-jet or deflected-jet type.